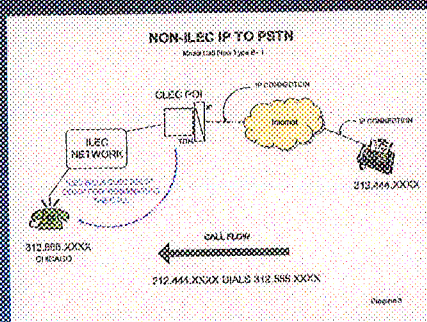


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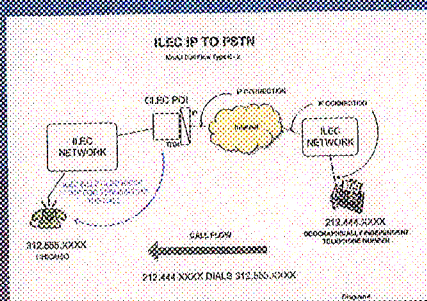
Slide 15

STEP 3:

Identify
“substitution” of
IP-voice for traffic
heretofore paying
switched access \$’s



Call Scenarios



Impact of VoIP Compensation Regime on ILEC Inter-Carrier Compensation (per MOU) Using Rates in Effect As of 2003

	Call Type	Origination ¹ Calling Party	Termination ¹ Called Party	Total	Note
A1	Traditional Toll ²	\$0.0141	\$0.0000	\$0.0141	Orig. on ILEC; Term. on "Cable"
	VoIP Under Recip. Comp.	(\$0.0007)	\$0.0000	(\$0.0007)	Call ILEC to VoIP; Term. on "Cable"
	VoIP Under Interstate Access	\$0.0060	\$0.0000	\$0.0060	Call ILEC to VoIP; Term. on "Cable"
A2	Traditional Toll ²	\$0.0141	\$0.0141	\$0.0283	Orig. on ILEC; Term. on ILEC
	VoIP Under Recip. Comp.	(\$0.0007)	\$0.0000	(\$0.0007)	Call ILEC to VoIP; Term. on "DSL"
	VoIP Under Interstate Access	\$0.0060	\$0.0060	\$0.0120	Call ILEC to VoIP; Term. on "DSL"
B1	Traditional Toll ²	\$0.0000	\$0.0141	\$0.0141	Orig. on "Cable"; Term. on ILEC
	VoIP Under Recip. Comp.	\$0.0000	\$0.0007	\$0.0007	VoIP call orig. on "Cable"; Term. on ILEC
	VoIP Under Interstate Access	\$0.0000	\$0.0060	\$0.0060	VoIP call orig. on "Cable"; Term. on ILEC
B2	Traditional Toll ²	\$0.0141	\$0.0141	\$0.0283	Orig. on ILEC; Term. on ILEC
	VoIP Under Recip. Comp.	\$0.0000	\$0.0007	\$0.0007	VoIP call orig. on "DSL"; Term. on ILEC
	VoIP Under Interstate Access	\$0.0060	\$0.0060	\$0.0120	VoIP call orig. on "DSL"; Term. on ILEC

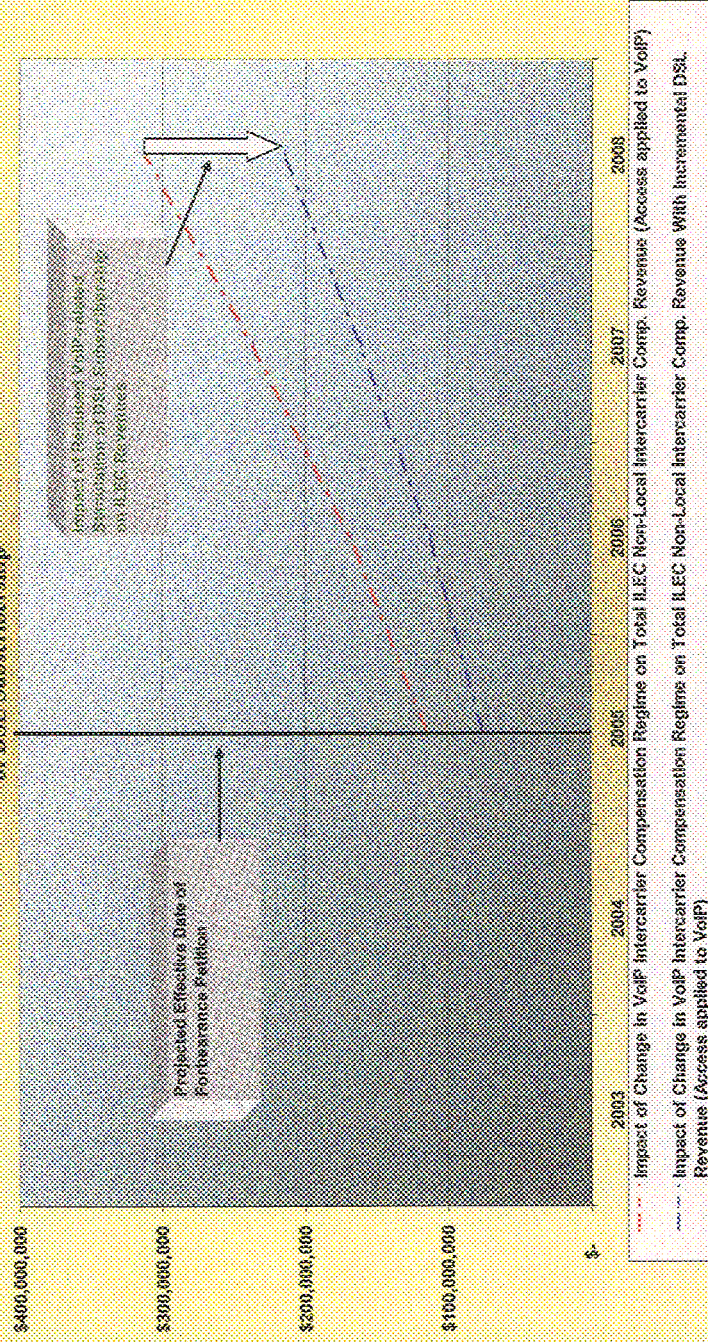
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Slide 16

STEP 4:

Evaluate application of switched access rates in lieu of reciprocal compensation on DSL Stimulation

CHART 2: ILECs Benefit From Applying Access to VoIP is Offset by Reduced VoIP-Related Stimulation of DSL Subscribership



Key User Inputs

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User Adjustable Inputs

1	% of VoIP lines attributable to customers who have already replaced wireline service with wireless service (or "cut the cord")	5.00%
2	% of VoIP lines attributable to business customers already having substituted special access for switched access lines	34.59%
3	% Switched Access Lines that are CLEC Lines (not ILECs)	14.90%
4	Factor by which VoIP customers exceed average originating toll patterns	2
5	Factor by which VoIP customers exceed average terminating toll patterns	1.5
6	Probability that Locally Dialed Call to VoIP is Terminated Non-locally	20.00%
7	% DSL-based VoIP Lines Where DSL is Ordered Because of VoIP Availability	15.00%
8	Assumed Monthly DSL End-User Revenue (per DSL customer)	\$30.00
9	Assumed Annual Change in Intrastate Access Rate	-5.00%
10	Forecasted Large ILEC Interstate Rate	\$0.006
11	Reciprocal Compensation rate	\$0.0007
12	% DSL lines that are ILEC DSL (not CLEC or IXC)	93.00%
13	% VoIP Lines that are ILEC VoIP (out of all DSL-based lines)	5.00%

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QoS Technical Consideration
 Network Week 1/20/04

IP Enabled Voice Services
 Issues of Enabling Switched Access Channels to
 IP-SIP Voice Services

Presented by: Joseph Chao
 Cisco Systems, Inc.

QoS

QoS
 Network
 Week
 1/20/04

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QSI TECHNICAL DOCUMENTATION

Document Number: 012605A

IP-Enabled Voice Services

*Impact of Applying Switched Access Charges to
IP-PSTN Voice Services*

FCC Wireline Competition Bureau
Docket Nos. 04-36, 03-266



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Attachments

Attachment 1: *VoIP Impact Model* Print-Out

Attachment 2: Call Flow Diagrams

Attachment 3: Bibliography

Executive Summary

I. EXECUTIVE SUMMARY

A. Introduction and Purpose

IP-enabled voice services, also referred to in this report as Voice over Internet Protocol or VoIP,¹ provide enhanced features and functionality, as well as cost savings for both consumers and suppliers.² As a direct result, communications providers - including competitive local exchange carriers ("CLECs"), interexchange carriers ("IXCs"), incumbent local exchange carriers ("ILECs") and non-carrier information services providers ("ISPs") - are deploying VoIP services at a rapid pace.³ Likewise, both residential and business consumers are replacing traditional circuit-switched, voice services provided over the Public Switched Telecommunication Network ("PSTN") with VoIP (this is especially true for IP-PSTN services which are the focus of this analysis).⁴ The purpose of this report and accompanying analysis is to provide information that will assist the Federal Communications Commission ("FCC") in understanding the economic and regulatory impacts of this technology transition as they relate specifically to ILEC switched access and broadband revenues.

This analysis was performed in an effort to identify and compare the impact on ILEC revenues (specifically switched access and broadband revenues) associated with (1) granting the *Level 3 Communications LLC ("Level 3") Forbearance Petition*,⁵ or, (2) on the other hand, imposing interstate switched access charges on non-local IP-PSTN IP-

-
- ¹ In this report, we refer to the IP-PSTN IP-enabled services as "IP-enabled services" or "VoIP." We recognize that both "IP-enabled services" and "VoIP" are terms that can encompass a wider range of services than the ones that we model here. Our conclusions are limited to the IP-PSTN IP-enabled services modeled herein, and do not attempt to cover other services that could potentially be included within the labels "IP-enabled services" or "VoIP."
- ² For example, Verizon has already cut its VoiceWing VoIP product from \$39.95 to \$29.95 and AT&T and Vonage have recently reduced their residential prices by \$5. Atlantic-ACM Report *VoIP Revolution 2004-2009* at 54. According to Atlantic-ACM (quoting Morgan Stanley's Telecommunications Survey), the mean decrease in communications spending as a result of adopting VoIP for medium and large businesses in June 2004 was 24.6%. *Id.* at 79. Also, according to Atlantic-ACM (quoting Deutsche Bank), VoIP network costs can be 10%-40% less than TDM circuit-switched service depending on legacy architecture and type and quality of network. *Id.* at 92.
- ³ Qwest was the first RBOC to offer residential VoIP services in December of 2003 and was the first RBOC to offer access charge-free termination of IP traffic. Since that time, Verizon has deployed a residential VoIP service, and (as of 3Q04) SBC is trialing a residential VoIP product. All RBOCs have VoIP products for business customers.
- ⁴ Due to the distance *insensitivity* of VoIP services, residential and business customers are replacing both local and toll PSTN services with VoIP. Since Level 3's Forbearance Petition is requesting forbearance from the application of switched access charges to VoIP, this analysis focuses only on "non-local" VoIP services (or VoIP services to the extent they are replacing traditional toll - not local) services.
- ⁵ See *Level 3 Communications LLC, Petition for Forbearance Under 47 USC Section 160(c) from Enforcement of 47 USC Section 251(g), Rule 51.701(b)(1), and Rule 69.5(b)*, WC Docket No. 03-266 (filed December 23, 2003) ("*Level 3 Petition*").

Executive Summary

enabled services. Because this study was prepared to assist the Commission in its evaluation of the *Level 3 Petition*, we have tailored this study to correspond as closely as possible with that petition. For example, the *Level 3 Petition* excludes from the scope of its requested forbearance those geographic areas served by ILECs that are not subject to the market-opening requirements of Section 251(c) of the Act (e.g., see Section 251(f) of the Communications Act of 1934).⁶ Thus, this study approximates the scope of the *Level 3 Petition* by evaluating the economic impact for Regional Bell Operating Companies – “RBOCs” – (including both rural and non-rural study areas) as well as all other non-rural, non-RBOC ILEC study areas.

In summary, the *Level 3 Petition* asks the FCC to confirm, for covered geographic areas, that carriers serving VoIP providers may exchange traffic with LECs under the current *de facto* intercarrier compensation mechanism used for the majority of VoIP traffic exchanged by carriers today – i.e., reciprocal compensation.⁷ Whereas traditional circuit-switched voice traffic that originates in one local calling area and terminates in another (e.g., “toll traffic”) is generally subject to intra- and inter-state access charges collected solely by LECs,⁸ VoIP providers have generally taken the position that they are information service providers.⁹ As such, VoIP providers use tariffed business services to connect with a PSTN carrier (usually a CLEC) who then exchanges with other carriers traffic bound for a customer not served by that LEC.¹⁰ When the LEC serving the VoIP provider exchanges traffic with another LEC or CMRS carrier, that traffic is subject to

⁶ See 47 U.S.C. § 251(f)(1). Throughout this study, the Communications Act of 1934, 47 U.S.C. § 151 *et seq.* will be referred to as the “Communications Act” or “Act.”

⁷ The *Level 3 Petition* refers to this traffic as “voice-embedded IP-PSTN traffic” (*Level 3 Petition* at 2). We use the terms “voice embedded IP traffic,” “IP-enabled services” and “VoIP” synonymously throughout this report.

⁸ We do not, in this summary, attempt to enumerate the exceptions to this generalization.

⁹ With respect to the IP-PSTN IP-enabled service traffic that is subject to this report, all VoIP traffic includes a net protocol conversion. In addition, the VoIP service may include other enhanced features and functions. See *Vonage Holdings Corporation Petition for Declaratory Ruling Concerning an Order of the Minnesota Public Utilities Commission*, Memorandum Opinion and Order, 19 FCC Rcd 22404, 22424 ¶32 (2004) (“*Vonage Order*”). On the basis of these protocol conversions and/or enhancements, IP-PSTN IP enabled services appear to meet the statutory definition of “information services.”

¹⁰ Many VoIP providers currently operate as non-regulated “information service” providers, which reduces overall regulatory burden and allows the VoIP provider to qualify to originate and terminate traffic without payment of access charges. As such, they are not eligible to enter into interconnection agreements directly with incumbent LECs. Therefore, VoIP providers typically purchase network access from CLECs, which, in turn, exchange traffic with the ILECs pursuant to interconnection agreements. In some instances, the CLEC and the VoIP provider may be the same entity, as CLECs are not required to provide enhanced services or information services through a separate affiliate.

It is also important to note that not all VoIP traffic is exchanged without payment of access charges, a fact that is reflected in our quantitative analysis. Outbound calls placed by VoIP users may be subject to access charges if they terminate “off-net” in a location at which the VoIP provider does not purchase direct network access. Inbound calls placed by PSTN users to VoIP services will typically be subject to access charges if the dialed number is not “local” to the calling party.

Executive Summary

reciprocal compensation payments made between the originating and terminating carrier based upon interconnection agreements. Thus, when a consumer chooses to replace a traditional circuit-switched voice service with VoIP, LECs terminating a “non-local” call from that customer no longer receive switched access revenues, but instead, receive reciprocal compensation payments. Similarly, when a PSTN user calls a VoIP customer using a “locally-dialed” number, the originating LEC does not receive originating access, but instead pays reciprocal compensation, even when the VoIP customer is physically located outside the PSTN user’s local calling area.

The *VoIP Impact Model*, designed by QSI Consulting, Inc. (“QSI”), and described in this report, evaluates those differing compensation arrangements and quantifies the impact of two specific compensation scenarios that generally frame the debate over the *Level 3 Petition*:

- **Scenario 1:** consistent with the *Level 3 Petition*, assume reciprocal compensation applies to VoIP traffic as a transitional mechanism until such time as broad-based intercarrier compensation reform can be instituted,
- **Scenario 2:** assume the FCC changes the status quo related to intercarrier compensation for VoIP traffic and imposes interstate switched access charges on the “non-local” VoIP traffic covered by the *Level 3 Petition*.¹¹

QSI defines the difference in intercarrier revenues recovered by the RBOCs and non-rural other ILECs in relation to *Scenario 1* versus *Scenario 2* as the “impact” of applying interstate access charges. The impact of imposing access charges on VoIP, which alternatively could be viewed as the impact of continuing the *de facto* status quo through forbearance (or any other ruling that access charges do not apply), is of interest for numerous reasons; however, the primary purpose of this analysis is to quantify the impact as it relates to ILEC switched access and broadband revenues.

Carriers opposing the *Level 3 Petition* have raised concerns about universal service based on the theory that ILEC switched access charges set substantially above cost implicitly fund high cost areas. Hence, according to this theory, VoIP services which do not produce switched access revenues have the potential to harm universal service objectives. While we take no position relative to this theory, we note that the purpose of the analysis is to provide a quantifiable impact on ILEC switched access revenues (other than exempt rural companies) so that a debate on the issue can, at a minimum, be discussed factually. By quantifying the difference between *Scenario 1* (application of reciprocal compensation) and *Scenario 2* (application of interstate switched access) described

¹¹ SBC’s recently filed TIPToP tariff also would apply switched access charges to “local” VoIP traffic. See Ameritech Operating Companies FCC Tariff No. 2, Section 25.3, Original Pages 25-21 and 22, effective November 25, 2004. This study does not attempt to quantify the impact of the TIPToP tariff specifically, or, more generally, imposing access charges on “local” VoIP traffic.

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above, the FCC can better understand the implications of forbearance as a transition mechanism to more comprehensive intercarrier compensation reform.

B. Results

Measuring the impact of VoIP services on switched access and broadband revenues for ILECs not under the rural exemption is a multi-faceted undertaking. To be properly understood and interpreted, the results must be viewed in context and as a whole. Toward this end, the QSI analysis tracks numerous data specific to ILEC switched access revenues and the results of applying either reciprocal compensation or switched access charges to VoIP traffic. Nonetheless, we believe the most pertinent results show that applying interstate access charges to “non-local” IP-PSTN IP enabled services will increase the combined switched access and DSL revenues of the RBOCs and non-rural other ILECs as follows:

Table 1

Increase in Switched Access and DSL Revenue (RBOC and Non-Rural other ILECs)

2005	2006	2007	2008
\$74,941,313	\$111,310,115	\$159,989,800	\$213,596,195

This overall impact combines two, offsetting effects of shifting VoIP from the current, *de facto* application of the reciprocal compensation regime to an access charge regime at interstate access rates:

- (1) Increasing compensation for ILEC terminated minutes from reciprocal compensation rates, which generally run \$0.0007 per minute, to interstate access rates, which average approximately \$0.006 for the RBOCs, will tend to increase the amount of intercarrier compensation received by the ILEC. Similarly, in some instances, depending on how the interstate access regime was administered, the ILEC would also receive originating access on some ILEC-originated/IP-network terminated calls, rather than paying reciprocal compensation to the terminating IP network. This also increases ILEC intercarrier compensation.¹²

¹² If one starts with the assumption that interstate access revenues *should* apply to non-local, IP-PSTN IP enabled services, even though such charges are not levied today, this same data represents the amount of ILEC switched access revenues that ILECs would not receive in the future if the FCC grants Level 3’s requested forbearance and confirms the legality of the reciprocal compensation framework (as opposed to the switched access framework). We understand that parties have differing opinions related to that particular issue and we take no position in this analysis as to whether, as a normative matter, access charges or reciprocal compensation should apply. Indeed, this analysis relies upon data to demonstrate the potential ramifications of each position.